CLAIMS:

1. A lithographic projection apparatus comprising:

a radiation system configured to provide a beam of radiation;

a programmable patterning structure configured to pattern the beam according to a desired pattern;

a projection system configured to project the patterned beam onto a target portion of a substrate;

wherein said programmable patterning structure comprises a plurality of individually addressable pixel elements, wherein at least one of the pixel elements comprises:

a layer of electro-optical material having a birefringence that varies according to an applied voltage; and

a plurality of electrodes configured to apply a voltage to the layer sufficient to vary a birefringence of the electro-optical material,

wherein each pixel element is selectively configurable to modulate both of an amplitude and a phase of radiation that is incident on the pixel element.

2. The lithographic projection apparatus according to claim 1, further comprising a layer of reflective material configured to reflect radiation transmitted through the layer of electro-optical material.

3. The lithographic projection apparatus according to claim 1, wherein the layer of electro-optical material is formed from at least one of ammonium dihydrogen phosphate, deuterated ammonium dihydrogen phosphate, potassium dihydrogen phosphate, and deuterated potassium dihydrogen phosphate.

4. The lithographic projection apparatus according to claim 1, wherein said at least one pixel element further comprises:

a second layer of electro-optical material; and

at least one electrode configured to apply a second voltage to said second layer sufficient to vary the birefringence of the electro-optical material of said second layer,

wherein an extraordinary axis of said second layer is perpendicular to an extraordinary axis of the first layer.

5. The lithographic projection apparatus according to claim 1, wherein the layer of electro-optical material is formed from one of ammonium dihydrogen phosphate, deuterated ammonium dihydrogen phosphate, potassium dihydrogen phosphate, and deuterated potassium dihydrogen phosphate.

6. The lithographic projection apparatus according to claim 1, further comprising a layer of reflective material configured to reflect radiation transmitted through the layer of electro-optical material.

7. The lithographic projection apparatus according to claim 1, wherein said at least one pixel element further comprises an actuator configured to adjust a position of the layer of electro-optical material in at least a direction parallel to a beam of radiation incident on the pixel element.

8. The lithographic projection apparatus according to claim 7, further comprising a layer of reflective material configured to reflect radiation transmitted through the layer of electro-optical material.

9. The lithographic projection apparatus according to claim 7, wherein the layer of electro-optical material is formed from one of ammonium dihydrogen phosphate, deuterated ammonium dihydrogen phosphate, potassium dihydrogen phosphate, and deuterated potassium dihydrogen phosphate.

10. The lithographic projection apparatus according to claim 1, said apparatus further comprising a polarizing filter configured to attenuate radiation outgoing from at least one of the pixel elements, based on a polarization of the outgoing radiation.

11. The lithographic projection apparatus according to claim 1, further comprising a cooling unit configured to control a temperature of the layer of electro-

optical material to be above and substantially close to a Curie temperature of the layer.

12. A programmable patterning structure comprising a plurality of individually addressable pixel elements, wherein at least one of the pixel elements comprises:

a layer of electro-optical material having a birefringence that varies according to an applied voltage; and

a plurality of electrodes configured to apply a voltage to the layer sufficient to vary the birefringence of the electro-optical material,

wherein each pixel element is selectively configurable to modulate both of an amplitude and a phase of radiation that is incident on the pixel element.

13. The programmable patterning structure according to claim 12, further comprising a layer of reflective material configured to reflect radiation transmitted through the layer of electro-optical material.

14. The programmable patterning structure according to claim 12, wherein the layer of electro-optical material is formed from at least one of ammonium dihydrogen phosphate, deuterated ammonium dihydrogen phosphate, potassium dihydrogen phosphate, and deuterated potassium dihydrogen phosphate.

15. The programmable patterning structure according to claim 12, wherein said at least one pixel element further comprises:

a second layer of electro-optical material; and

at least one electrode configured to apply a second voltage to said second layer sufficient to vary a birefringence of the electro-optical material of said second layer,

wherein an extraordinary axis of said second layer is perpendicular to an extraordinary axis of the first layer.

16. The programmable patterning structure according to claim 12, wherein said at least one pixel element further comprises an actuator configured to adjust a

position of the layer of electro-optical material in at least a direction parallel to a beam of radiation incident on the pixel element.

17. The programmable patterning structure according to claim 12, said apparatus further comprising a polarizing filter configured to attenuate radiation outgoing from at least one of the pixel elements, based on a polarization of the outgoing radiation.

18. A device manufacturing method comprising:

providing a beam of radiation;

using a programmable patterning structure to pattern the beam according to a desired pattern; and

projecting the patterned beam onto a target portion of a substrate,

wherein the programmable patterning structure comprises a plurality of individually addressable pixel elements, wherein at least one of the pixel elements comprises:

a layer of electro-optical material having a birefringence that varies according to an applied voltage; and

a plurality of electrodes configured to apply a voltage to the layer sufficient to vary the birefringence of the electro-optical material,

wherein each pixel element is selectively configurable to modulate both of an amplitude and a phase of radiation that is incident on the pixel element.

19. The device manufacturing method according to claim 18, wherein said at least one pixel element further comprises:

a second layer of electro-optical material; and

at least one electrode configured to apply a second voltage to said second layer sufficient to vary the birefringence of the electro-optical material of said second layer,

wherein an extraordinary axis of said second layer is perpendicular to an extraordinary axis of the first layer.

20. The device manufacturing method according to claim 18, said method further comprising adjusting a position of the layer of electro-optical material in at least a direction parallel to a beam of radiation incident on the pixel element.

21. The device manufacturing method according to claim 18, said method further comprising attenuating radiation outgoing from at least one of the pixel elements, based on a polarization of the outgoing radiation.

22. The device manufacturing method according to claim 18, further comprising controlling a temperature of the layer of electro-optical material to be above and substantially close to a Curie temperature of the layer.

23. A device manufacturing method comprising:

providing a beam of radiation;

patterning the beam; and

projecting the patterned beam onto a target portion of a substrate,

wherein said patterning includes selectably configuring at least one of a plurality of pixel elements, and

wherein said selectably configuring includes applying a voltage sufficient to vary a birefringence of a layer of electro-optical material of the at least one pixel element, and

wherein said selectably configuring further includes modulating both of an amplitude and a phase of radiation that is incident on the at least one pixel element.

24. The device manufacturing method according to claim 23, wherein said selectably configuring further includes applying a second voltage sufficient to vary a birefringence of an second layer of electro-optical material of the at least one pixel element

25. The device manufacturing method according to claim 24, wherein an extraordinary axis of said second layer is perpendicular to an extraordinary axis of the first layer.

26. The device manufacturing method according to claim 23, said method further comprising adjusting a position of the layer of electro-optical material in at least a direction parallel to a beam of radiation incident on the pixel element.

27. The device manufacturing method according to claim 23, said method further comprising attenuating radiation outgoing from at least one of the pixel elements, based on a polarization of the outgoing radiation.

28. The device manufacturing method according to claim 23, further comprising controlling a temperature of the layer of electro-optical material to be above and substantially close to a Curie temperature of the layer.